

# SEQUENCE LISTING

<110> Falco, Saverio Carl  
Allen, Stephen M.

<120> Genes Encoding Sulfate Assimilation Proteins

<130> BB-1167-C

<140> 09/720,318

<141> 2000-12-21

<150> 60/092,833

<151> 1998-07-14

<160> 12

<170> Microsoft Office 97

<210> 1

<211> 1215

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (273)

<223> n = a, c, g or t

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<211> 293

<212> PRT

<213> Zea mays

<220>

<221> UNSURE

<222> (91)

<223> Xaa = any amino acid

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Tyr	Ala	Pro	Trp	Cys	Pro	Phe	Cys	Gln	Ala	Met	Glu	Ala	Ser	Tyr	Val
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Arg	Ala	Asp	Gly	Glu	Gln	Lys	Pro	Phe	Ala	Gln	Ala	Glu	Leu	Gln	Leu
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 <212> DNA  
 <213> Impatiens balsamia

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 gaatcaactg cagaaaccta gcagagctca actggattgt tgagttcata atgctttgac 960  
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 <212> PRT  
 <213> Impatiens balsamia

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 Arg Val Arg Lys Val Arg Pro Leu Arg Arg Ala Leu Lys Gly Leu Arg  
 35 40 45  
 Ala Trp Ile Thr Gly Gln Arg Lys Asp Gln Ser Pro Gly Thr Arg Ser  
 50 55 60  
 Glu Ile Pro Val Val Gln Val Asp Pro Ser Phe Glu Gly Leu Val Gly  
 65 70 75 80  
 Gly Glu Gly Ser Leu Val Lys Trp Asn Pro Leu Ala Asn Val Asp Gly  
 85 90 95  
 Arg Asp Val Trp Asn Phe Leu Arg Ala Met Asn Val Pro Val Asn Ala  
 100 105 110  
 Leu His Ser Gln Gly Tyr Val Ser Ile Gly Cys Glu Pro Cys Thr Arg  
 115 120 125

Pro Val Leu Pro Gly Gln His Glu Arg Glu Gly Arg Trp Trp Trp Glu  
 130 135 140  
 Asp Ala Ala Ala Lys Glu Cys Gly Leu His Lys Gly Asn Ile Lys Asp  
 145 150 155 160  
 Ala Asn Gly Asn Gly Val Ala Gln Ala Glu Gly Gly Glu Gly Thr Val  
 165 170 175  
 Thr Asp Ala Asp Ile Phe Glu Ser Lys Asn Val Val Thr Leu Ser Arg  
 180 185 190  
 Ser Gly Ile Glu Asn Leu Ser Lys Leu Gln Glu Arg Lys Glu Pro Trp  
 195 200 205  
 Ile Val Val Leu Tyr Ala Pro Trp Cys Gln Phe Cys Gln Gly Met Glu  
 210 215 220  
 Lys Ser Tyr Leu Glu Leu Ala Glu Lys Leu Ala Val Ser Gly Gly Gly  
 225 230 235 240  
 Val Lys Val Gly Lys Phe Arg Ala Asp Gly Ala Glu Lys Glu Phe Ala  
 245 250 255  
 His Gln Glu Leu Gln Leu Gly Ser Phe Pro Thr Ile Leu Phe Phe Pro  
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 Lys His Ser Ser Lys Ala Ile Lys Tyr Pro Ser Glu Lys Arg Asp Val  
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<211> 1795

<212> DNA

<213> Glycine max

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<210> 6
<211> 472
<212> PRT
<213> Glycine max

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      35              40              45

Val Ser Ser Gly Val Val Asn Leu Thr Gln Arg Arg Ser Ser Val Arg
      50              55              60

Pro Leu Asn Ala Glu Pro Gln Arg Asn Asp Ser Val Val Pro Leu Ala
      65              70              75              80

Ala Thr Ile Val Ala Pro Glu Val Glu Lys Glu Lys Glu Asp Phe Glu
      85              90              95

Gln Leu Ala Lys Asp Leu Glu Asn Ser Ser Pro Leu Glu Ile Met Asp
      100              105              110

Lys Ala Leu Glu Lys Phe Gly Asn Asp Ile Ala Ile Ala Phe Ser Gly
      115              120              125

Ala Glu Asp Val Ala Leu Ile Glu Tyr Ala His Leu Thr Gly Arg Pro
      130              135              140

Tyr Arg Val Phe Ser Leu Asp Thr Gly Arg Leu Asn Pro Glu Thr Tyr
      145              150              155              160

Lys Phe Phe Asp Ala Val Glu Lys His Tyr Gly Ile His Ile Glu Tyr
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Met Phe Pro Asp Ala Val Glu Val Gln Ala Leu Val Arg Thr Lys Gly
      180              185              190

Leu Phe Ser Phe Tyr Glu Asp Gly His Gln Glu Cys Cys Arg Val Arg
      195              200              205

Lys Val Arg Pro Leu Arg Arg Ala Leu Lys Gly Leu Lys Ala Trp Ile
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Thr Gly Gln Arg Lys Asp Gln Ser Pro Gly Thr Arg Ser Glu Ile Pro
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 Trp Asn Phe Leu Arg Thr Met Asn Val Pro Val Asn Ser Leu His Ser  
 275 280 285  
 Gln Gly Tyr Val Ser Ile Gly Cys Glu Pro Cys Thr Arg Pro Val Leu  
 290 295 300  
 Pro Gly Gln His Glu Arg Glu Gly Arg Trp Trp Trp Glu Asp Ala Lys  
 305 310 315 320  
 Ala Lys Glu Cys Gly Leu His Lys Gly Asn Leu Lys Gln Glu Asp Ala  
 325 330 335  
 Ala Gln Leu Asn Gly Asn Gly Thr Ser Gln Gly Asn Gly Ser Ala Thr  
 340 345 350  
 Val Ala Asp Ile Phe Ile Ser Gln Asn Val Val Ser Leu Ser Arg Ser  
 355 360 365  
 Gly Ile Glu Asn Leu Ala Lys Leu Glu Asn Arg Lys Glu His Trp Leu  
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 Val Val Leu Tyr Ala Pro Trp Cys Arg Phe Cys Gln Ala Met Glu Glu  
 385 390 395 400  
 Ser Tyr Val Asp Leu Ala Glu Lys Leu Ala Arg Ser Gly Val Lys Val  
 405 410 415  
 Ala Lys Phe Arg Ala Asp Gly Glu Gln Lys Glu Tyr Ala Lys Ser Glu  
 420 425 430  
 Leu Gln Leu Gly Ser Phe Pro Thr Ile Leu Leu Phe Pro Lys His Ser  
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<210> 7

<211> 1629

<212> DNA

<213> Glycine max

<400> 7

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<210> 8  
 <211> 466  
 <212> PRT  
 <213> Glycine max

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Glu Arg Pro Ile Gly Gly Ala Val Asn Phe Asn Leu Ser Gln Arg Arg
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Ser Leu Val Lys Pro Val Asn Ala Glu Pro Pro Arg Lys Asp Ser Ile
          50                      55                      60

Val Pro Leu Ala Ala Thr Thr Ile Val Ala Ser Ala Ser Glu Thr Lys
          65                      70                      75                      80

Glu Glu Asp Phe Glu Gln Ile Ala Ser Asp Leu Asp Asn Ala Ser Pro
          85                      90                      95

Leu Glu Ile Met Asp Arg Ala Leu Asp Lys Phe Gly Asn Asp Ile Ala
          100                      105                      110

Ile Ala Phe Ser Gly Ala Glu Asp Val Ala Leu Ile Glu Tyr Ala Lys
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Leu Thr Gly Arg Pro Phe Arg Val Phe Ser Leu Asp Thr Gly Arg Leu
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Asn Pro Glu Thr Tyr Gln Leu Phe Asp Ala Val Glu Lys His Tyr Gly
          145                      150                      155                      160

Ile Arg Ile Glu Tyr Met Phe Pro Asp Ala Val Glu Val Gln Ala Leu
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Leu	Arg	Ala	Trp	Ile	Thr	Gly	Gln	Arg	Lys	Asp	Gln	Ser	Pro	Gly	Thr		
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Arg	Ser	Glu	Ile	Pro	Val	Val	Gln	Val	Asp	Pro	Ala	Phe	Glu	Gly	Met		
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Asp	Gly	Gly	Ile	Gly	Ser	Leu	Val	Lys	Trp	Asn	Pro	Val	Ala	Asn	Val		
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Lys	Gly	His	Asp	Ile	Trp	Asn	Phe	Leu	Arg	Thr	Met	Asn	Val	Pro	Val		
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Asn	Ser	Leu	His	Ala	Lys	Gly	Tyr	Val	Ser	Ile	Gly	Cys	Glu	Pro	Cys		
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Thr	Arg	Pro	Val	Leu	Pro	Gly	Gln	His	Glu	Arg	Glu	Gly	Arg	Trp	Trp		
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Trp	Glu	Asp	Ala	Lys	Ala	Lys	Glu	Cys	Gly	Leu	His	Lys	Gly	Asn	Val		
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Glu	Asp	Arg	Lys	Glu	Pro	Trp	Leu	Val	Val	Leu	Tyr	Ala	Pro	Trp	Cys		
	370					375					380						
Pro	Tyr	Cys	Gln	Ala	Met	Glu	Glu	Ser	Tyr	Val	Asp	Leu	Ala	Asp	Lys		
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Leu	Ala	Gly	Ser	Thr	Gly	Met	Lys	Val	Gly	Lys	Phe	Arg	Ala	Asp	Gly		
			405						410					415			
Glu	Gln	Lys	Glu	Phe	Ala	Lys	Ser	Glu	Leu	Gln	Leu	Gly	Ser	Phe	Pro		
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Thr	Ile	Leu	Phe	Phe	Pro	Lys	His	Ser	Ser	Arg	Pro	Thr	Ile	Lys	Tyr		
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<212> DNA  
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 gcaggagctg gtgggcgcgt cgcgcgtgga gatcatggat cgtgcgctcg acatgttcgg 420  
 ctccgaaatc gccatcgct tcaagtgtgc cgaggacgtg gccctcatcg aatacgcgaa 480  
 actgactgga cggcccttca ggggtgttcag ccttgacact gggcgactga acccagagac 540  
 atacgaactc ttcgacaagg tggagaagca ctatggtatc cacatcgagt acatgttccc 600  
 tgaggccagc gaggtgcaag accttgtgag gagcaagggc ctcttctctt tctacgagga 660  
 cggacaccag gagtgtgca ggggtaggaa ggttcggccc ttgaggaggg ccctcaaggg 720  
 cctcaaggcc tggatcaccg ggcagaggaa ggatcagtc cctggacca gagccagcat 780  
 ccctgttggt caagttgatc cgtcttttga agggctggat ggtggagccg gttagcttgat 840  
 caagtgaac cctgtggcta atgtggatgg caaggatatc tggaccttcc tcaggaccat 900  
 ggatgtccct gtgaacaccc tgcattgctca aggctacgtc tccattgggt gcgagccgtg 960  
 caccaggccc gtgttgccgg ggcagcacga gaggaaggg aggtggtggt gggaggacgc 1020  
 caccgccaag gagtgcggcc tgcacaacgg taacatcgac aagggaaggc aggcacccaa 1080  
 ggtcggcgct aacggcaacg gctcggccga ggccagcgcc ccagacatct tccagagcca 1140  
 ggccatcgct aacctcaccg gtcccgggat cgagaacctc ctgcggctcg agaaccgcgc 1200  
 cgagccgtgg ctaccgtcc tctacgtctc ctggtgccc tactgccagg caatggaggc 1260  
 gtcctacgtt gagctggccg agaagctgag cggctcaggc atcaagggtg ccaagttccg 1320  
 gcgggacggc gagcagaagc cattcgcgca ggcggagctg caactacaga gcttcccgac 1380  
 gatcctcctg tccccggcc gcaccgtgaa gcccatcaag taccgctccg agaagaggga 1440  
 cgtccagtc ctctcgcct tctgaacag cctcagatga gtggtcagag aaccggagaa 1500  
 ccacgttct ctgcattggt accggcggtg tctaggcatt attatgtagt ggtagcgaga 1560  
 gaggatggat caacggaaat gttggagaca gaggagtgtg gggacgcagg gacagcggct 1620  
 caaagcccct ccattataag ggggtgggga tttgtgtgta gttgtagcta gatgtttgta 1680  
 aggaagttca aataagagta ctagttttga aattttgatc caaggcttca tcgagagttt 1740  
 ggacaatata ctcgtggttc actcgttcaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1800  
 aaaaaaaaaa aaaaaaaaaa aaaaaaa 1827

<210> 10  
 <211> 463  
 <212> PRT  
 <213> Triticum aestivum

<400> 10  
 Met Ala Ser Ala Thr Ala Ser Ile Ser Ser His Ser Ile Ala Leu Arg  
 1 5 10 15  
 Asp Leu Lys Ala Ala Arg Ile Gly Ala Val Arg Gln Gln Val Ala Val  
 20 25 30  
 Val Pro Ala Gly Leu Pro Ala Thr Ala Pro Lys Gly Gln Arg Ala Arg  
 35 40 45  
 Ala Val Arg Pro Leu Cys Ala Ala Glu Pro Ala Arg Lys Pro Val Ser  
 50 55 60  
 Ala Ser Ala Ala Ser Ser Pro Val Ala Pro Val Glu Glu Glu Ala Ser  
 65 70 75 80  
 Ala Val Ala Ala Val Asp Tyr Glu Ala Leu Ala Gln Glu Leu Val Gly  
 85 90 95

Ala	Ser	Pro	Leu	Glu	Ile	Met	Asp	Arg	Ala	Leu	Asp	Met	Phe	Gly	Ser		
			100					105					110				
Glu	Ile	Ala	Ile	Ala	Phe	Ser	Gly	Ala	Glu	Asp	Val	Ala	Leu	Ile	Glu		
		115					120					125					
Tyr	Ala	Lys	Leu	Thr	Gly	Arg	Pro	Phe	Arg	Val	Phe	Ser	Leu	Asp	Thr		
	130					135					140						
Gly	Arg	Leu	Asn	Pro	Glu	Thr	Tyr	Glu	Leu	Phe	Asp	Lys	Val	Glu	Lys		
145					150					155					160		
His	Tyr	Gly	Ile	His	Ile	Glu	Tyr	Met	Phe	Pro	Glu	Ala	Ser	Glu	Val		
			165						170					175			
Gln	Asp	Leu	Val	Arg	Ser	Lys	Gly	Leu	Phe	Ser	Phe	Tyr	Glu	Asp	Gly		
		180						185					190				
His	Gln	Glu	Cys	Cys	Arg	Val	Arg	Lys	Val	Arg	Pro	Leu	Arg	Arg	Ala		
		195					200					205					
Leu	Lys	Gly	Leu	Lys	Ala	Trp	Ile	Thr	Gly	Gln	Arg	Lys	Asp	Gln	Ser		
	210					215					220						
Pro	Gly	Thr	Arg	Ala	Ser	Ile	Pro	Val	Val	Gln	Val	Asp	Pro	Ser	Phe		
225					230					235					240		
Glu	Gly	Leu	Asp	Gly	Gly	Ala	Gly	Ser	Leu	Ile	Lys	Trp	Asn	Pro	Val		
				245					250					255			
Ala	Asn	Val	Asp	Gly	Lys	Asp	Ile	Trp	Thr	Phe	Leu	Arg	Thr	Met	Asp		
			260					265					270				
Val	Pro	Val	Asn	Thr	Leu	His	Ala	Gln	Gly	Tyr	Val	Ser	Ile	Gly	Cys		
		275					280					285					
Glu	Pro	Cys	Thr	Arg	Pro	Val	Leu	Pro	Gly	Gln	His	Glu	Arg	Glu	Gly		
	290					295					300						
Arg	Trp	Trp	Trp	Glu	Asp	Ala	Thr	Ala	Lys	Glu	Cys	Gly	Leu	His	Asn		
305					310					315					320		
Gly	Asn	Ile	Asp	Lys	Glu	Gly	Gln	Ala	Pro	Lys	Val	Gly	Val	Asn	Gly		
				325					330					335			
Asn	Gly	Ser	Ala	Glu	Ala	Ser	Ala	Pro	Asp	Ile	Phe	Gln	Ser	Gln	Ala		
			340					345					350				
Ile	Val	Asn	Leu	Thr	Arg	Pro	Gly	Ile	Glu	Asn	Leu	Leu	Arg	Leu	Glu		
		355					360					365					
Asn	Arg	Ala	Glu	Pro	Trp	Leu	Thr	Val	Leu	Tyr	Ala	Pro	Trp	Cys	Pro		
	370					375					380						
Tyr	Cys	Gln	Ala	Met	Glu	Ala	Ser	Tyr	Val	Glu	Leu	Ala	Glu	Lys	Leu		
385					390					395					400		
Ser	Gly	Ser	Gly	Ile	Lys	Val	Ala	Lys	Phe	Arg	Ala	Asp	Gly	Glu	Gln		
				405					410					415			

Lys Pro Phe Ala Gln Ala Glu Leu Gln Leu Gln Ser Phe Pro Thr Ile  
                     420                    425                    430

Leu Leu Phe Pro Gly Arg Thr Val Lys Pro Ile Lys Tyr Pro Ser Glu  
                     435                    440                    445

Lys Arg Asp Val Gln Ser Leu Leu Ala Phe Val Asn Ser Leu Arg  
                     450                    455                    460

<210> 11  
 <211> 463  
 <212> PRT  
 <213> Catharanthus roseus

<400> 11  
 Met Ala Leu Ala Phe Thr Ser Ser Thr Ala Ile His Gly Ser Leu Ser  
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Ser Ser Phe Glu Gln Thr Lys Ala Ala Ala Gln Phe Gly Ser Phe  
                     20                    25                    30

Gln Pro Leu Asp Arg Pro His Thr Ile Ser Pro Ser Val Asn Val Ser  
                     35                    40                    45

Arg Arg Arg Leu Ala Val Lys Pro Ile Asn Ala Glu Pro Lys Arg Asn  
                     50                    55                    60

Glu Ser Ile Val Pro Ser Ala Ala Thr Thr Val Ala Pro Glu Val Glu  
                     65                    70                    75                    80

Glu Lys Val Asp Val Glu Asp Tyr Glu Lys Leu Ala Asp Glu Leu Gln  
                     85                    90                    95

Asn Ala Ser Pro Leu Glu Ile Met Asp Lys Ser Leu Ala Lys Phe Gly  
                     100                    105                    110

Asn Asp Ile Ala Ile Ala Phe Ser Gly Ala Glu Asp Val Ala Leu Ile  
                     115                    120                    125

Glu Tyr Ala His Leu Thr Gly Arg Pro Phe Arg Val Phe Ser Leu Asp  
                     130                    135                    140

Thr Gly Arg Leu Asn Pro Glu Thr Tyr Lys Phe Phe Asp Thr Val Glu  
                     145                    150                    155                    160

Lys Gln Tyr Gly Ile His Ile Glu Tyr Met Phe Pro Asp Ala Val Glu  
                     165                    170                    175

Val Gln Ala Leu Val Arg Ser Lys Gly Leu Phe Ser Phe Tyr Glu Asp  
                     180                    185                    190

Gly His Gln Glu Cys Cys Arg Val Arg Lys Val Arg Pro Leu Arg Arg  
                     195                    200                    205

Ala Leu Lys Gly Leu Arg Ala Trp Ile Thr Gly Gln Arg Lys Asp Gln  
                     210                    215                    220

Ser Pro Gly Thr Arg Ser Glu Ile Pro Val Val Gln Val Asp Pro Val  
                     225                    230                    235                    240

Phe Glu Gly Met Asp Gly Gly Val Gly Ser Leu Val Lys Trp Asn Pro  
 245 250 255  
 Val Ala Asn Val Glu Gly Lys Asp Ile Trp Asn Phe Leu Arg Ala Met  
 260 265 270  
 Asp Val Pro Val Asn Thr Leu His Ser Gln Gly Tyr Val Ser Ile Gly  
 275 280 285  
 Cys Glu Pro Cys Thr Arg Pro Val Leu Pro Gly Gln His Glu Arg Glu  
 290 295 300  
 Gly Arg Trp Cys Trp Glu Asp Ala Lys Ala Lys Glu Cys Gly Leu His  
 305 310 315 320  
 Lys Gly Asp Ile Lys Glu Gly Thr Leu Ile Ile Trp Asp Gly Ala Val  
 325 330 335  
 Asn Gly Asn Gly Ser Asp Thr Ile Ala Asp Ile Phe Asp Thr Asn Asn  
 340 345 350  
 Val Thr Ser Leu Ser Arg Pro Gly Ile Glu Asn Leu Leu Lys Leu Glu  
 355 360 365  
 Glu Arg Arg Glu Ala Trp Leu Val Val Leu Tyr Ala Pro Trp Cys Arg  
 370 375 380  
 Phe Cys Gln Ala Met Glu Gly Ser Tyr Leu Glu Leu Ala Glu Lys Leu  
 385 390 395 400  
 Ala Gly Ser Gly Val Lys Val Gly Lys Phe Lys Ala Asp Gly Asp Gln  
 405 410 415  
 Lys Ala Phe Ala Gln Gln Glu Leu Gln Leu Asn Ser Ser Pro Thr Ile  
 420 425 430  
 Leu Phe Phe Pro Lys His Ser Ser Lys Pro Ile Lys Tyr Pro Ser Glu  
 435 440 445  
 Lys Arg Asp Val Asp Ser Leu Met Ala Phe Val Asn Ala Leu Arg  
 450 455 460

<210> 12

<211> 465

<212> PRT

<213> Arabidopsis thaliana

<400> 12

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 Asn Ser Arg Phe Gly Val Ser Leu Glu Pro Lys Val Ser Gln Ile Gly  
 20 25 30  
 Ser Leu Arg Leu Leu Asp Arg Val His Val Ala Pro Val Ser Leu Asn  
 35 40 45  
 Leu Ser Gly Lys Arg Ser Ser Ser Val Lys Pro Leu Asn Ala Glu Pro  
 50 55 60

Lys	Thr	Lys	Asp	Ser	Met	Ile	Pro	Leu	Ala	Ala	Thr	Met	Val	Ala	Glu	65	70	75	80
Ile	Ala	Glu	Glu	Val	Glu	Val	Val	Glu	Ile	Glu	Asp	Phe	Glu	Glu	Leu	85	90	95	
Ala	Lys	Lys	Leu	Glu	Asn	Ala	Ser	Pro	Leu	Glu	Ile	Met	Asp	Lys	Ala	100	105	110	
Leu	Glu	Lys	Tyr	Gly	Asn	Asp	Ile	Ala	Ile	Ala	Phe	Ser	Gly	Ala	Glu	115	120	125	
Asp	Val	Ala	Leu	Ile	Glu	Tyr	Ala	His	Leu	Thr	Gly	Arg	Pro	Phe	Arg	130	135	140	
Val	Phe	Ser	Leu	Asp	Thr	Gly	Arg	Leu	Asn	Pro	Glu	Thr	Tyr	Arg	Phe	145	150	155	160
Phe	Asp	Ala	Val	Glu	Lys	His	Tyr	Gly	Ile	Arg	Ile	Glu	Tyr	Met	Phe	165	170	175	
Pro	Asp	Ser	Val	Glu	Val	Gln	Gly	Leu	Val	Arg	Ser	Lys	Gly	Leu	Phe	180	185	190	
Ser	Phe	Tyr	Glu	Asp	Gly	His	Gln	Glu	Cys	Cys	Arg	Val	Arg	Lys	Val	195	200	205	
Arg	Pro	Leu	Arg	Arg	Ala	Leu	Lys	Gly	Leu	Lys	Ala	Trp	Ile	Thr	Gly	210	215	220	
Gln	Arg	Lys	Asp	Gln	Ser	Pro	Gly	Thr	Arg	Ser	Glu	Ile	Pro	Val	Val	225	230	235	240
Gln	Val	Asp	Pro	Val	Phe	Glu	Gly	Leu	Asp	Gly	Gly	Val	Gly	Ser	Leu	245	250	255	
Val	Lys	Trp	Asn	Pro	Val	Ala	Asn	Val	Glu	Gly	Asn	Asp	Val	Trp	Asn	260	265	270	
Phe	Leu	Arg	Thr	Met	Asp	Val	Pro	Val	Asn	Thr	Leu	His	Ala	Ala	Gly	275	280	285	
Tyr	Ile	Ser	Ile	Gly	Cys	Glu	Pro	Cys	Thr	Lys	Ala	Val	Leu	Pro	Gly	290	295	300	
Gln	His	Glu	Arg	Glu	Gly	Arg	Trp	Trp	Trp	Glu	Asp	Ala	Lys	Ala	Lys	305	310	315	320
Glu	Cys	Gly	Leu	His	Lys	Gly	Asn	Val	Lys	Glu	Asn	Ser	Asp	Asp	Ala	325	330	335	
Lys	Val	Asn	Gly	Glu	Ser	Lys	Ser	Ala	Val	Ala	Asp	Ile	Phe	Lys	Ser	340	345	350	
Glu	Asn	Leu	Val	Thr	Leu	Ser	Arg	Gln	Gly	Ile	Glu	Asn	Leu	Met	Lys	355	360	365	
Leu	Glu	Asn	Arg	Lys	Glu	Pro	Trp	Ile	Val	Val	Leu	Tyr	Ala	Pro	Trp	370	375	380	

Cys	Pro	Phe	Cys	Gln	Ala	Met	Glu	Ala	Ser	Tyr	Asp	Glu	Leu	Ala	Asp
385					390					395					400
Lys	Leu	Ala	Gly	Ser	Gly	Ile	Lys	Val	Ala	Lys	Phe	Arg	Ala	Asp	Gly
				405					410					415	
Asp	Gln	Lys	Glu	Phe	Ala	Lys	Gln	Glu	Leu	Gln	Leu	Gly	Ser	Phe	Pro
			420					425					430		
Thr	Ile	Leu	Val	Phe	Pro	Lys	Asn	Ser	Ser	Arg	Pro	Ile	Lys	Tyr	Pro
		435					440					445			
Ser	Glu	Lys	Arg	Asp	Val	Glu	Ser	Leu	Thr	Ser	Phe	Leu	Asn	Leu	Val
	450					455					460				
Arg															
465															